

REMARKS

Reconsideration and further examination of the present application is respectfully requested.

Information Disclosure Statement

U.S. Patent No. 4,485,550 ("Doyle") is submitted in an attached Information Disclosure Statement (IDS) form. Doyle teaches formation of a removable alignment component and formation of silicide regions.

Claim Rejections

The following arguments were previously submitted in a response filed September 24, 2001, which address rejections to pending claims 1-19. While the Advisory Action mailed October 9, 2001 addresses the argument that the Examiner's conclusion of obviousness is based upon improper hindsight (which is not re-presented), Applicants respectfully request that each argument re-presented be addressed.

Claims 1-12 and 16 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,063,677 ("Rodder") in view of U.S. Patent No. 5,937,300 ("Sekine") and U.S. Patent No. 5,994,179 ("Masuoka"). Applicants respectfully traverse these rejections as follows.

In rejecting claims 1-12 and 16, the Office Action on page 2, line 19 - page 3, line 13 states:

...Rodder does not disclose a method of forming the silicide regions. Sekine teaches in figure 13b depositing a metal layer (813) over a substrate (801) and an alignment component (805, 804 and 810). Sekine further teaches of reacting the metal layer with the semiconductor material of the substrate to form two silicide

regions (814) that are self aligned to the alignment component, the silicide regions having inner surfaces which face one another, wherein an upper portion of each inner surface contacts the alignment component and a lower portion of each inner surface contacts the semiconductor material of the substrate. It would have been obvious to one of ordinary skill in the art at the time of the present invention to use the method of forming silicide regions of Sekine that include lower and upper portions of silicide regions in the method of Rodder in order to decrease the resistance of the silicide film as stated by Sekine in column 2, lines 15-30. ... Rodder and Sekine do not disclose that the alignment component consists of a single material. Masuoka teaches in figures 3a-3j an alignment component (3) consisting of a single material. It would have been obvious to one of ordinary skill in the art at the time of the present invention to use the alignment component consisting of a single material of Masuoka in the method of Rodder and Sekine...

The Office Action suggests one of ordinary skill in the art would have been motivated to combine the method of Sekine with the method of Rodder in order to decrease the resistance of the silicide film as stated by Sekine in column 2, lines 15-30. Applicants submit that Sekine teaches away from this suggested combination, describing the problems associated with obtaining the desired resistance value using the SALICIDE process of Figure 13 in column 2, lines 30-35 and lines 36-55.

Applicants also submit that to combine the method of Sekine and the alignment component of Masuoka with the method of Rodder would require a series of steps which would not have been obvious to one of ordinary skill in the art. Applicants also submit that the suggested combination of Rodder and Sekine would require modifications not taught or suggested by either reference. According to MPEP § 2143.01 (Rev. 1, Feb. 2000):

A statement that modifications of the prior art to meet the claimed invention would have been “ ‘well within the ordinary skill of the art at the time the claimed invention was made’ ” because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a *prima facie* case of obviousness without some objective reason to combine the teachings of the references. *Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993).

Therefore, Applicants respectfully submit that it would not have been obvious to one of ordinary skill in the art to modify the method of Rodder to include the method of Sekine and use of the alignment component of Masuoka.

Applicants also submit that while dummy gates 3 of Masuoka consist of a single material, sidewall spacers 4 consist of a separate material. If dummy gates 3 alone are interpreted to form an alignment component, then sidewalls 4 would prevent the formation of silicide regions substantially extending up the alignment component, as claimed in the present application. If, on the other hand, dummy gates 3 and sidewalls 4 are together interpreted to form an alignment component, the alignment component does not consist of a single material, as claimed in the present application. Therefore, Applicants also respectfully submit that any combination of Rodder, Sekine and/or Masuoka would not have resulted in the present invention as claimed.

Accordingly, Applicants respectfully submit that claim 1 is patentable over Rodder, Sekine and/or Masuoka. Claims 2-12 and 16 depend directly or indirectly from claim 1. Therefore, Applicants submit that claims 2-12 and 16 are also patentable over Rodder, Sekine and/or Masuoka. Accordingly, Applicants respectfully request removal of this rejection.

Claims 13-15 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Rodder, Sekine, and/or Masuoka in further view of U.S. Patent No. 6,054,355 ("Inumiya"). Applicants submit that Inumiya does not affect the patentability of claim 1. Because claims 13-15 depend directly or indirectly from claim 1, Applicants submit that claims 13-15 are patentable over Rodder, Sekine and/or Masuoka in view of Inumiya. Accordingly, Applicants respectfully

request removal of this rejection.

Claims 17-19 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Rodder, Sekine, Masuoka and Inumiya, and further in view of U.S. Patent No. 6,051,865 ("Gardner"). Applicants submit that Gardner does not affect the patentability of claim 1. Because claims 17-19 depend directly or indirectly from claim 1, Applicants submit that claims 17-19 are patentable over Rodder, Sekine, Masuoka and Inumiya in view of Gardner. Accordingly, Applicants respectfully request removal of this rejection.

New Claims

Claims 26-32 have been added. Independent claim 26 recites formation of silicide regions aligned with the alignment component that form Schottky junctions with the semiconductor material. Applicants respectfully submit that references previously cited fail to teach or suggest a method that would result in the formation of Schottky junctions aligned with the alignment component, as claimed in the present application.

U.S. Patent No. 4,485,550 ("Koeneké"), cited by the present application, discloses a method of forming silicide, similar to the method of Sekine, that results in Schottky junction source/drain contacts. However, the contacts are separated from the gate edge by sidewall spacers 30 of Figure 8, resulting in an undesirable resistive component between the gate edge and the silicide, as stated in column 6, lines 17-25. Spacers 30 are required, according to the methods of Sekine and Koeneké, to prevent shorts between the silicide and the gate during silicide formation as stated in column 5, lines 40-47.

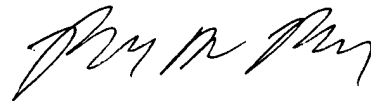
The present application eliminates this resistive component by forming silicide regions before forming the gate, so that no spacers are required, resulting in Schottky junctions aligned with the gate edge. Shorts are prevented by depositing dielectric material 240 on sidewalls 236 of opening 232. Forming Schottky contacts before gate fabrication is contrary to the methods by Koeneké and Sekine.

CONCLUSION

Applicants respectfully submit the present application is in condition for allowance, for which early action is earnestly solicited. The Examiner is invited to telephone the undersigned to help expedite any further prosecution of the present application.

The Commissioner is hereby authorized to credit any overpayment or to charge any fees or fee deficiencies under 37 C.F.R. § 1.16 and § 1.17 in connection with this communication to our Deposit Account No. 02-2666.

Respectfully submitted,
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IN THE CLAIMS

Claims 26-32 have been added.